

# Piezoelectric Sound Components



## Piezoelectric Sounders External Drive Pin Type

Now microcomputers are widely used for microwave ovens, air conditioners, cars, toys, timers, and other alarm equipment. Externally driven piezoelectric sounders are used in digital watches, electronic calculators, telephones and other equipment. They are driven by a signal (ex: 2048Hz or 4096Hz) from an LSI and provide melodious sound.

### ■ Features

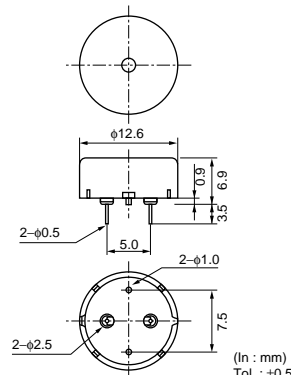
1. Low power consumption
2. No contacts therefore, no noise and highly reliable

### ■ Applications

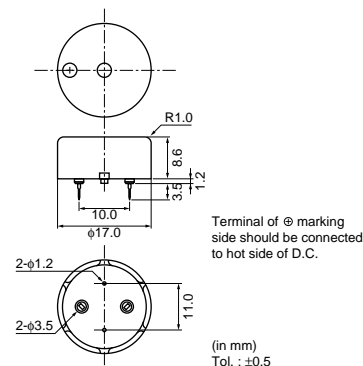
1. Telephone ringers
2. Various office equipment such as PPCs, printers and keyboards
3. Various home appliances such as microwave ovens
4. Confirmation sound of various audio equipment



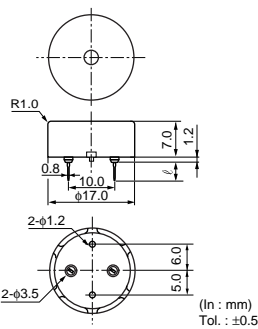
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PKM17EPP-2002-B0



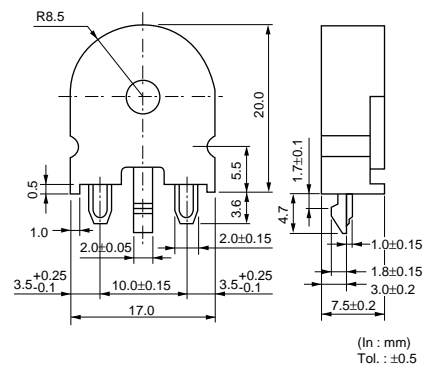
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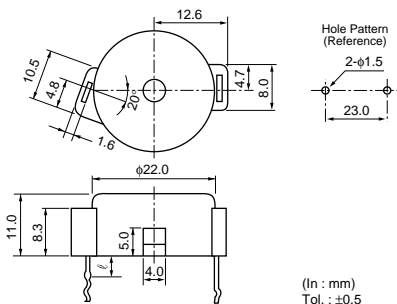
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| PKM17EPP-4002-B0 | 3.5 |



PKM17EPT-4001-B0



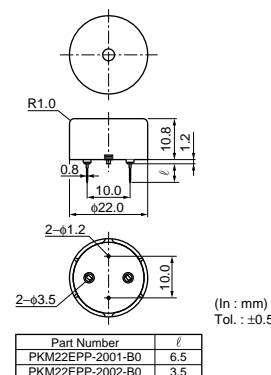
PKM22EP-2001



| Part Number  | ℓ    |
|--------------|------|
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| PKM22EP-2002 | 8.0  |
| PKM22EP-2003 | 12.0 |



PKM22EPP-2001-B0



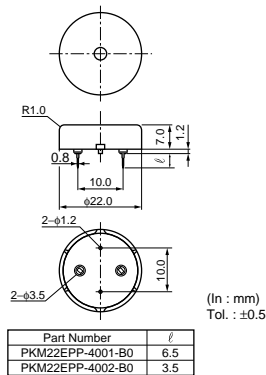
| Part Number      | ℓ   |
|------------------|-----|
| PKM22EPP-2001-B0 | 6.5 |
| PKM22EPP-2002-B0 | 3.5 |

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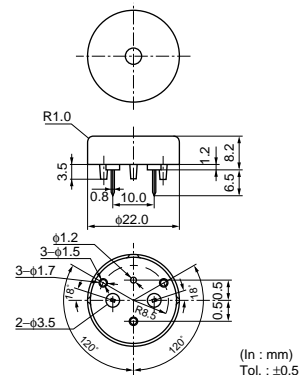
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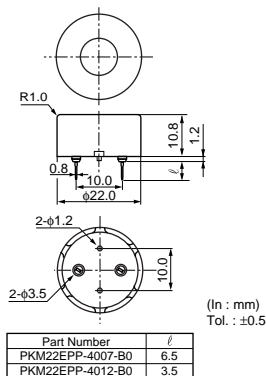
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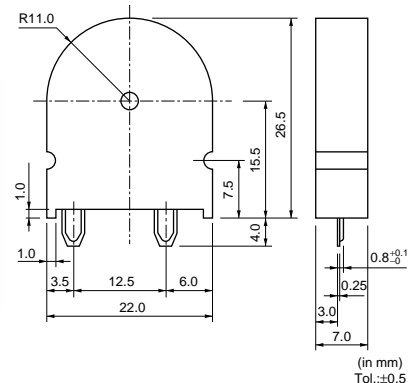
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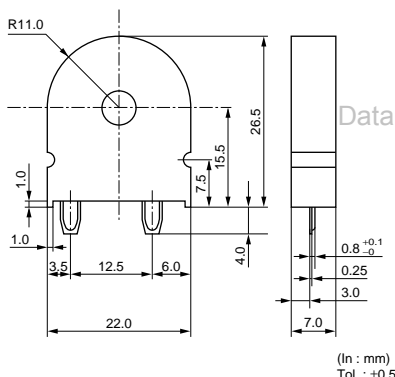
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PKM22EPT-2001-B0



PKM22EPT-4001-B0



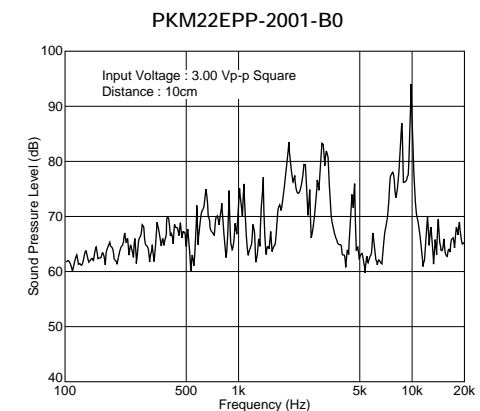
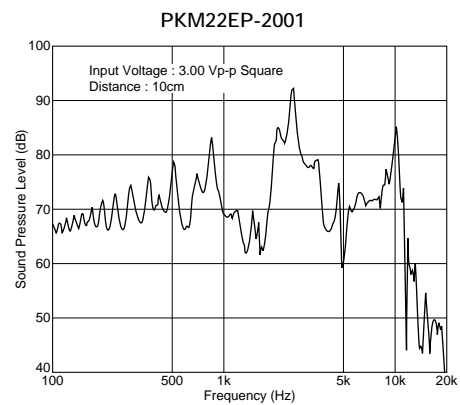
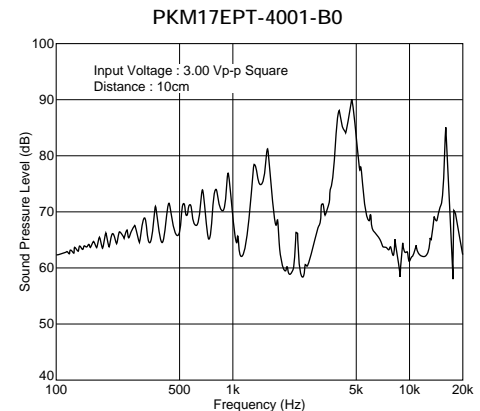
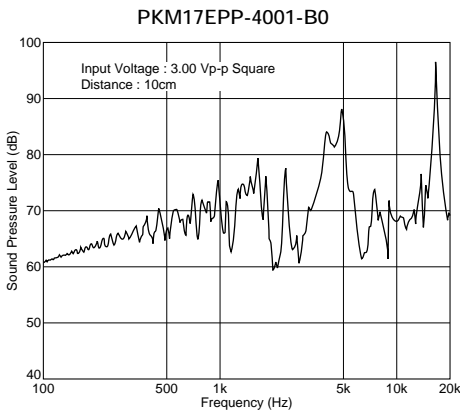
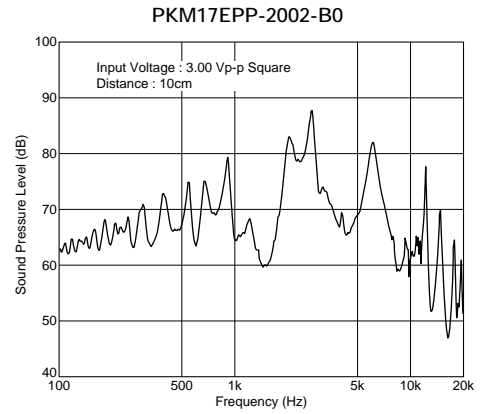
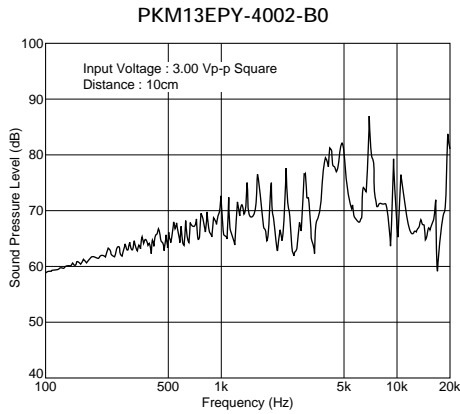
| Part Number      | Sound Pressure Level (dB)                | Sound Pressure Level (Ref. only) (dB)  | Min. of Operating Voltage Range | Capacitance (nF)         | Operating Temp. Range | Storage Temp. Range |
|------------------|--|--|---------------------------------|--------------------------|-----------------------|---------------------|
| PKM13EPY-4002-B0 | 70 min.<br>[3Vp-p,4kHz,square wave,10cm] | 70 min.<br>[1Vrms,4kHz,sine wave,10cm] | 30 Vp-p max.                    | 5.5 $\pm 30\%$<br>[1kHz] | -20 to +70°C          | -30 to +80°C        |
| PKM17EPP-2002-B0 | 70 min.<br>[3Vo-p,2kHz,square wave,10cm] | 70 min.<br>[1Vrms,2kHz,sine wave,10cm] | 25 Vo-p max.<br>[with polarity] | 34 $\pm 30\%$<br>[120Hz] | -20 to +70°C          | -30 to +80°C        |
| PKM17EPP-4001-B0 | 72 min.<br>[3Vp-p,4kHz,square wave,10cm] | 72 min.<br>[1Vrms,4kHz,sine wave,10cm] | 25 Vp-p max.                    | 7 $\pm 30\%$<br>[1kHz]   | -20 to +70°C          | -30 to +80°C        |
| PKM17EPT-4001-B0 | 75 min.<br>[3Vp-p,4kHz,square wave,10cm] | 75 min.<br>[1Vrms,4kHz,sine wave,10cm] | 25 Vp-p max.                    | 9.5 $\pm 30\%$<br>[1kHz] | -20 to +70°C          | -30 to +80°C        |
| PKM22EP-2001     | 75 min.<br>[3Vp-p,2kHz,square wave,10cm] | 75 min.<br>[1Vrms,2kHz,sine wave,10cm] | 25 Vp-p max.                    | 17 $\pm 30\%$<br>[120Hz] | -20 to +70°C          | -30 to +80°C        |
| PKM22EPP-2001-B0 | 70 min.<br>[3Vp-p,2kHz,square wave,10cm] | 70 min.<br>[1Vrms,2kHz,sine wave,10cm] | 25 Vp-p max.                    | 19 $\pm 30\%$<br>[120Hz] | -20 to +70°C          | -30 to +80°C        |
| PKM22EPP-4001-B0 | 75 min.<br>[3Vp-p,4kHz,square wave,10cm] | 75 min.<br>[1Vrms,4kHz,sine wave,10cm] | 25 Vp-p max.                    | 12 $\pm 30\%$<br>[1kHz]  | -20 to +70°C          | -30 to +80°C        |
| PKM22EPP-4005-B0 | 75 min.<br>[3Vp-p,4kHz,square wave,10cm] | 75 min.<br>[1Vrms,4kHz,sine wave,10cm] | 25 Vp-p max.                    | 12 $\pm 30\%$<br>[1kHz]  | -20 to +70°C          | -30 to +80°C        |
| PKM22EPP-4007-B0 | 85 min.<br>[3Vp-p,4kHz,square wave,10cm] | 85 min.<br>[1Vrms,4kHz,sine wave,10cm] | 25 Vp-p max.                    | 12 $\pm 30\%$<br>[1kHz]  | -20 to +70°C          | -30 to +80°C        |

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| Part Number      | Sound Pressure Level (dB)                | Sound Pressure Level (Ref. only) (dB)  | Min. of Operating Voltage Range | Capacitance (nF)   | Operating Temp. Range | Storage Temp. Range |
|------------------|--|--|---------------------------------|--------------------|-----------------------|---------------------|
| PKM22EPT-2001-B0 | 70 min.<br>[3Vp-p,2kHz,square wave,10cm] | 70 min.<br>[1Vrms,2kHz,sine wave,10cm] | 25 Vp-p max.                    | 19 ±30%<br>[120Hz] | -20 to +70°C          | -30 to +80°C        |
| PKM22EPT-4001-B0 | 85 min.<br>[3Vp-p,4kHz,square wave,10cm] | 85 min.<br>[1Vrms,4kHz,sine wave,10cm] | 25 Vp-p max.                    | 10 ±30%<br>[1kHz]  | -20 to +70°C          | -30 to +80°C        |

■ Freq. Response (Square Wave 3Vp-p, 10cm)



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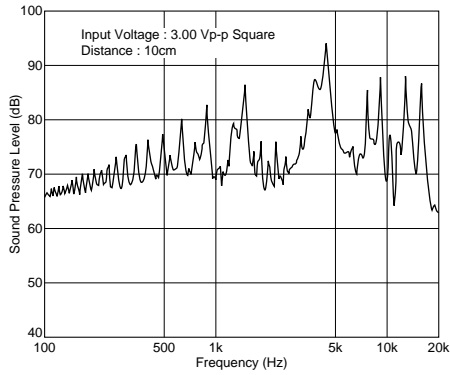
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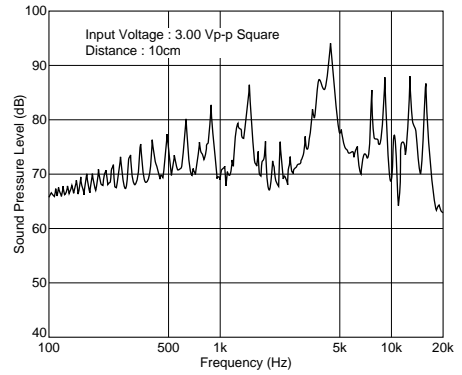
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■ Freq. Response (Square Wave 3Vp-p, 10cm)

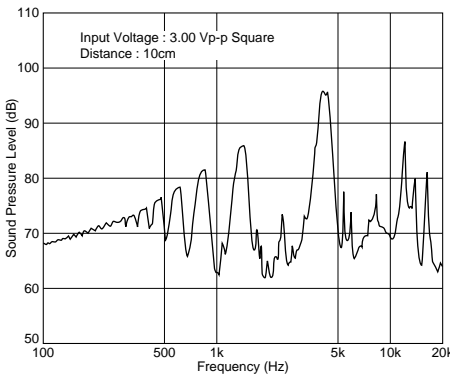
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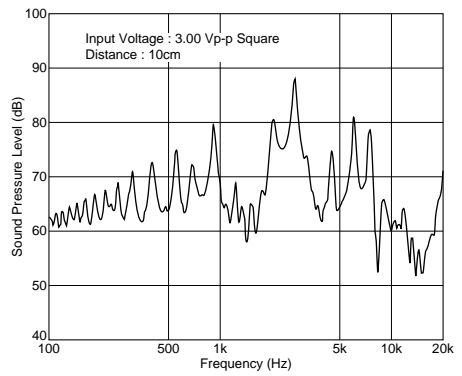
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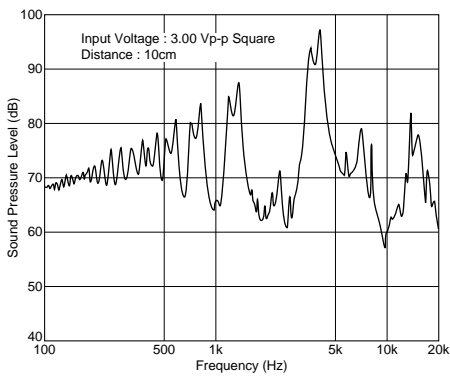


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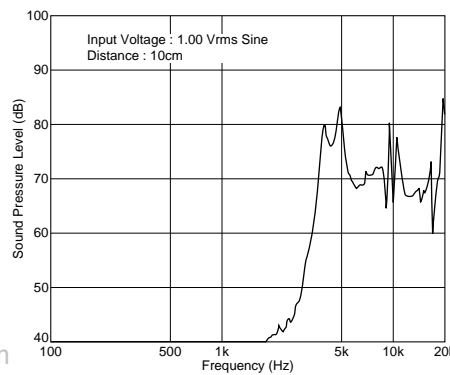
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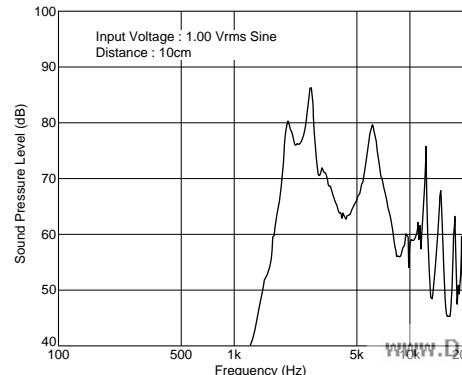


■ Freq. Response (Sine Wave 1Vrms, 10cm)

PKM13EPY-4002-B0



PKM17EPP-2002-B0



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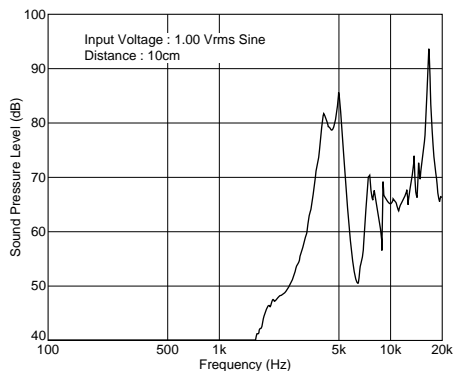
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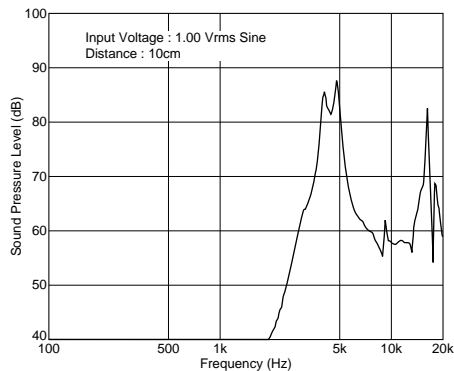
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Freq. Response (Sine Wave 1Vrms, 10cm)

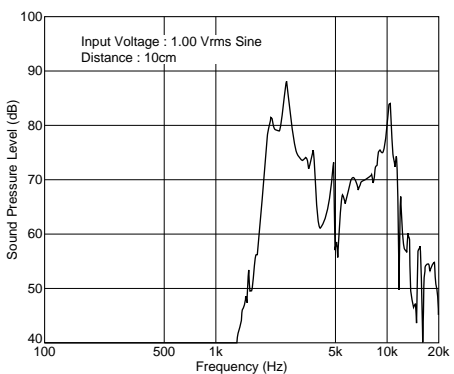
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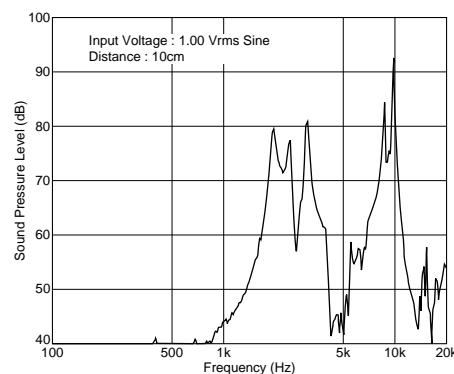
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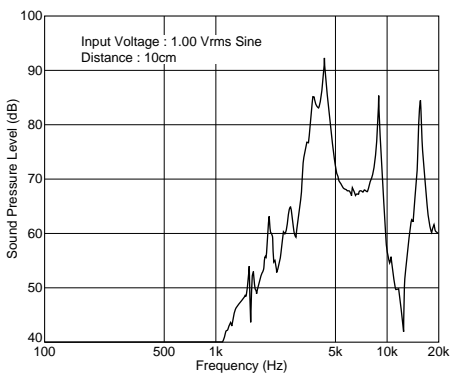
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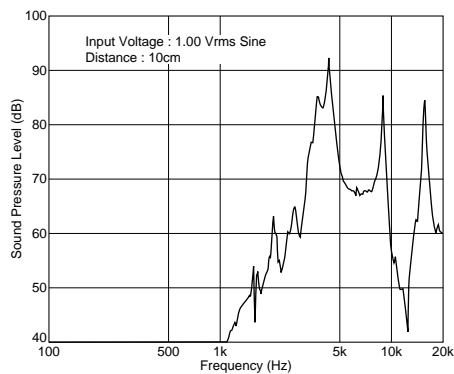
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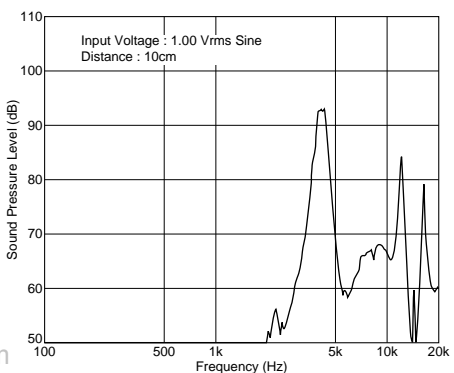
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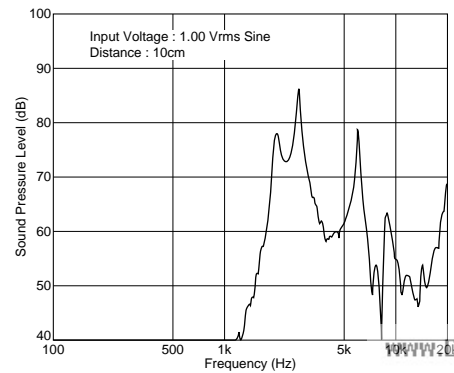
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PKM22EPP-4007-B0



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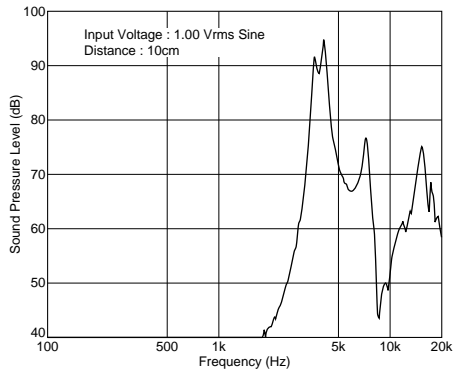
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### ■ Freq. Response (Sine Wave 1Vrms, 10cm)

PKM22EPT-4001-B0



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# Piezoelectric Sound Components

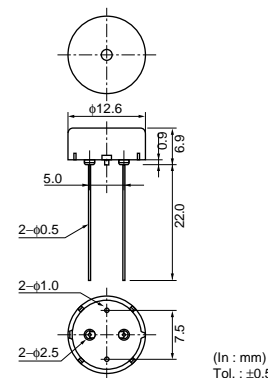
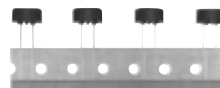
## Piezoelectric Sounders External Drive Pin Type Taping

Taking advantage of extensive automatic insertion design technology and materials experience, Murata has developed standard taping type piezoelectric sounder.

This Murata technology supports labor and cost saving activities.

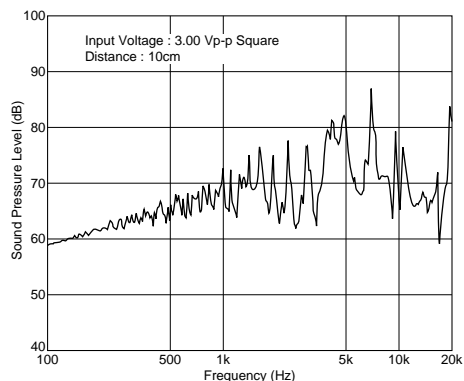
### ■ Features

1. High and stable mountability
2. Ammo packaging
3. Minimum quantity (order in sets only): 500 pcs.

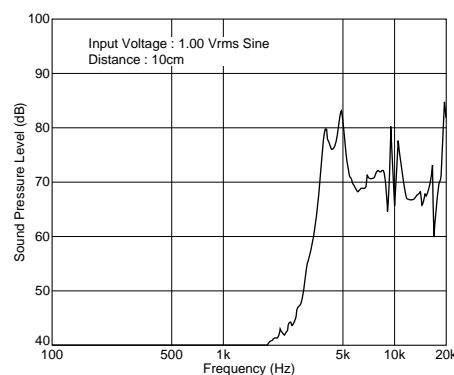


| Part Number             | Sound Pressure Level (dB)                | Sound Pressure Level (Ref. only) (dB)  | Min. of Operating Voltage Range | Capacitance (nF)   | Operating Temp. Range | Storage Temp. Range |
|-------------------------|--|--|---------------------------------|--------------------|-----------------------|---------------------|
| <b>PKM13EPY-4000-A0</b> | 70 min.<br>[3Vp-p,4kHz,square wave,10cm] | 70 min.<br>[1Vrms,4kHz,sine wave,10cm] | 30 Vp-p max.                    | 5.5 ±30%<br>[1kHz] | -20 to +70°C          | -30 to +80°C        |

### ■ Freq. Response (Square Wave 3Vp-p, 10cm)



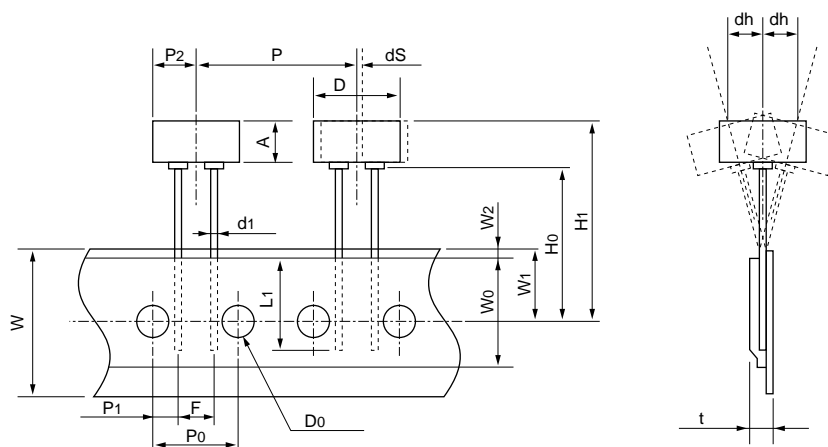
### ■ Freq. Response (Sine Wave 1Vrms, 10cm)



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## ■ Taping Dimension



| Item  | Code | Nominal Value | Tol.            | Remarks  |
|---|------|---------------|-----------------|--|
| Width of diameter   | D    | ø12.6         | ±0.5            |  |
| Height of component   | A    | 6.9           | ±0.5            |  |
| Dimensions of terminal  | d1   | ø0.5          | ±0.1            |  |
| Lead length under the hold down tape                          | L1   | 8.0 min.      | —               |  |
| Pitch of component  | P    | 25.4          | ±0.5            |  |
| Pitch of sprocket   | P0   | 12.7          | ±0.2            | Tolerance for Pitches 10XP0=127±2mm              |
| Length from hole center to lead                               | P1   | 3.85          | ±0.7            |  |
| Length from hole center to component center                   | P2   | 6.35          | ±0.7            |  |
| Lead spacing  | F    | 5.0           | ±0.5            |  |
| Slant to the forward or backward                              | dh   | ±1.0          | 360° : 1mm max. |  |
| Width of carrier tape   | W    | 18.0          | ±0.5            |  |
| Width of hold down tape                                       | W0   | 12.5 min.     | —               | Hold down tape does not exceed the carrier tape. |
| Position of sprocket hole                                     | W1   | 9.0           | ±0.5            |  |
| Gap of hold down tape and carrier tape                        | W2   | 2.0 max.      | —               |  |
| Distance between the center of sprocket hole and lead stopper | H0   | 18.0          | ±0.5            |  |
| Total height of component                                     | H1   | 26.0 max.     | —               |  |
| Diameter of sprocket hole                                     | D0   | ø4.0          | ±0.2            |  |
| Total thickness of tape                                       | t    | 0.6           | ±0.2            |  |
| Body tilt   | dS   | 0             | ±1.0            |  |

(in mm)



# Piezoelectric Sound Components



## Piezoelectric Sounders External Drive Lead Wire Type

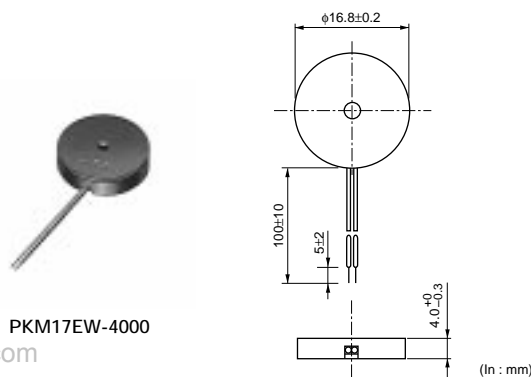
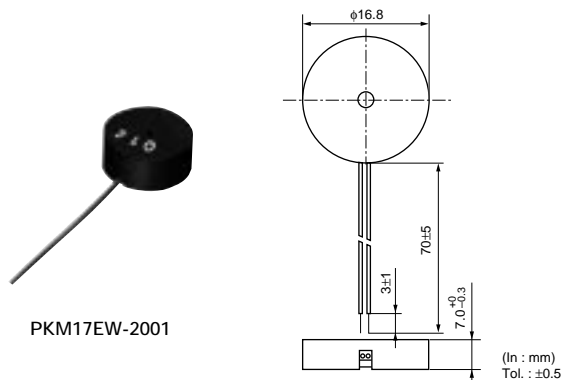
Now microcomputers are widely used for microwave ovens, air conditioners, cars, toys, timers, and other alarm equipment. Externally driven piezoelectric sounders are used in digital watches, electronic calculators, telephones and other equipment. They are driven by a signal (ex: 2048Hz or 4096Hz) from an LSI and provide melodious sound.

### ■ Features

1. Low power consumption
2. No contacts therefore, no noise and highly reliable

### ■ Applications

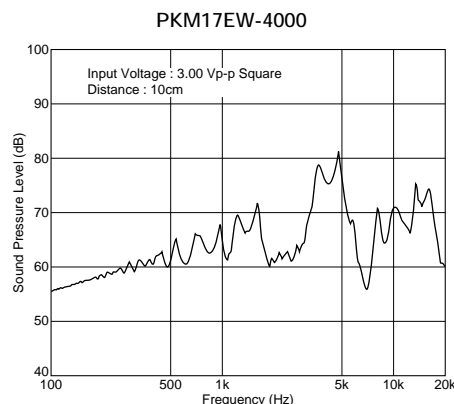
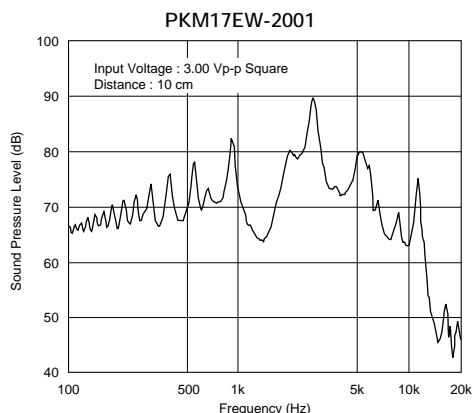
1. Telephone ringers
2. Various office equipment such as PPCs, printers and keyboards
3. Various home appliances such as microwave ovens
4. Confirmation sound of various audio equipment



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| Part Number         | Sound Pressure Level (dB)                   | Sound Pressure Level (Ref. only) (dB)     | Min. of Operating Voltage Range | Capacitance (nF)   | Operating Temp. Range | Storage Temp. Range |
|---------------------|---|---|---------------------------------|--------------------|-----------------------|---------------------|
| <b>PKM17EW-2001</b> | 72 min.<br>[3Vp-p, 2kHz, square wave, 10cm] | 70 min.<br>[1Vrms, 2kHz, sine wave, 10cm] | 7 Vp-p max.                     | 40 ±30%<br>[120Hz] | -20 to +70°C          | -30 to +80°C        |
| <b>PKM17EW-4000</b> | 75 min.<br>[3Vp-p, 4kHz, square wave, 10cm] | 70 min.<br>[1Vrms, 4kHz, sine wave, 10cm] | 25 Vp-p max.                    | 9.5 ±30%<br>[1kHz] | -20 to +70°C          | -30 to +80°C        |

### ■ Freq. Response (Square Wave 3Vp-p, 10cm)

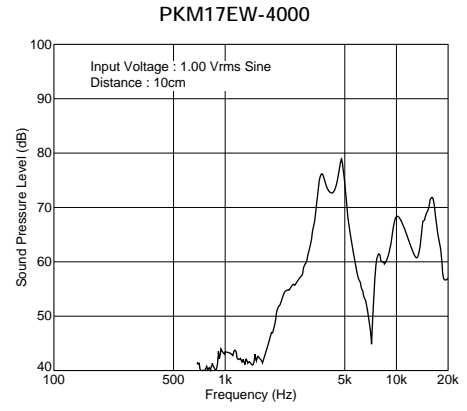
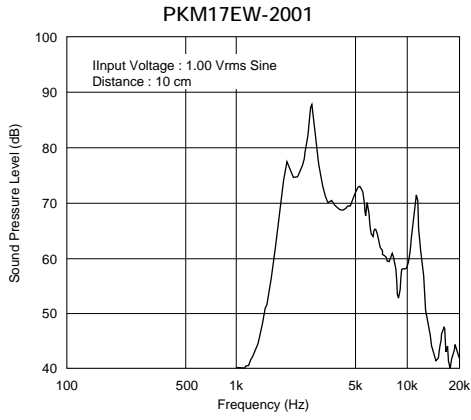


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Freq. Response (Sine Wave 1Vrms, 10cm)



# Piezoelectric Sound Components

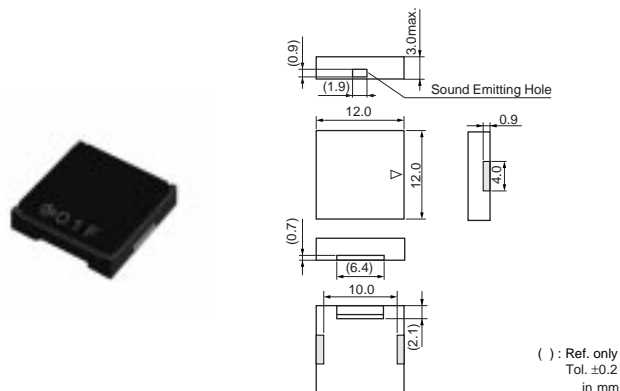


## Piezoelectric Sounders External Drive SMD Type

Taking advantage of extensive acoustic and mechanical design technology and high performance ceramics, Murata has developed SMD piezoelectric sounders that suite the thin, high-density design of electronic equipment.

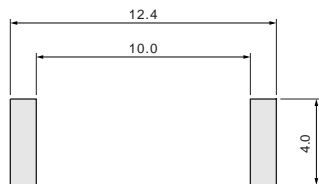
### ■ Features

1. High S.P.L. and clear sound
2. Reflowable
3. Tape & Reel supply
4. Minimum quantity (order in sets only): 1,000 pcs.



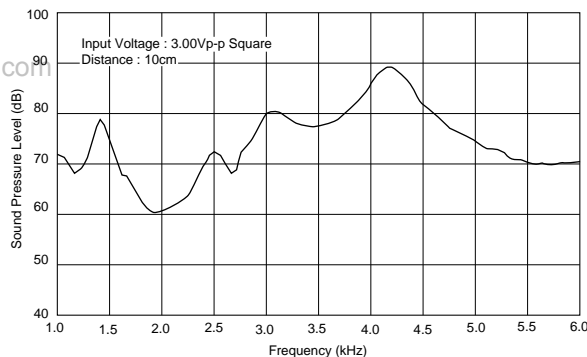
| Part Number       | Sound Pressure Level (dB)            | Max. of Operating Voltage Range (Vp-p) | Operating Temp. Range | Storage Temp. Range | Use                        |
|-------------------|--------------------------------------|--|-----------------------|---------------------|----------------------------|
| PKLCS1212E4001-R1 | 75 min.[3Vp-p,4kHz,square wave,10cm] | 25 max.                                | -20 to +70°C          | -30 to +80°C        | For consumer electronics   |
| PKLCS1212E40A1-R1 | 75 min.[3Vp-p,4kHz,square wave,10cm] | 25 max.                                | -40 to +85°C          | -40 to +85°C        | For automotive electronics |

### ■ Standard Land Pattern Dimensions



(in mm)

### ■ Freq. Response (Square Wave 3Vp-p, 10cm)

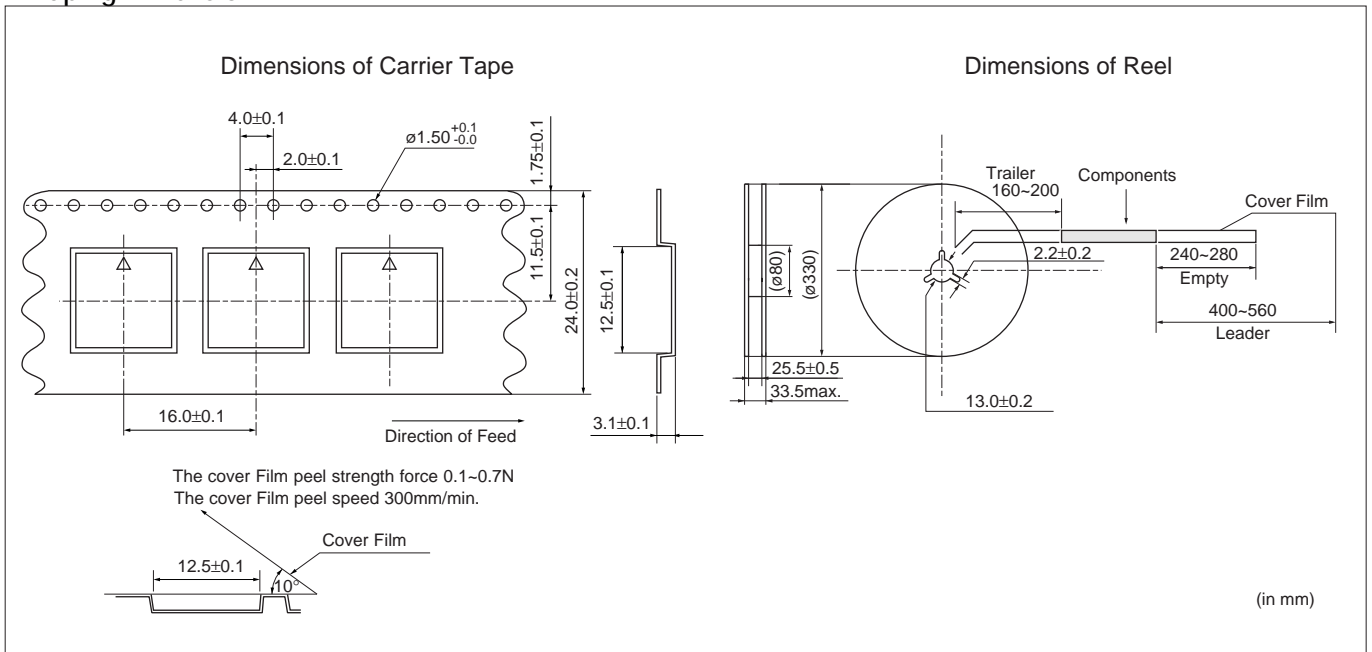


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Note Please read rating and CAUTION (for storage, operating, rating, soldering, mounting and handling) in this PDF catalog to prevent smoking and/or burning, etc. This catalog has only typical specifications. Therefore, you are requested to approve our product specifications or to transact the approval sheet for product specifications before ordering.

Continued from the preceding page.

### Taping Dimension



5

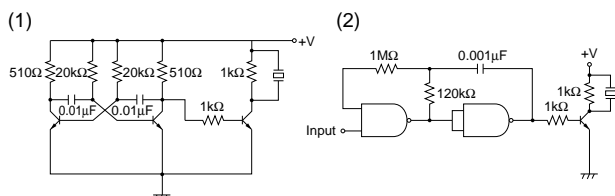
## Piezoelectric Sounders (External Drive) Circuit/Notice

### ■ Circuit

The following are examples of externally driven circuits.

(1) Unstable multi-vibrator using Tr.

(2) Circuits using inverters or NAND gates.

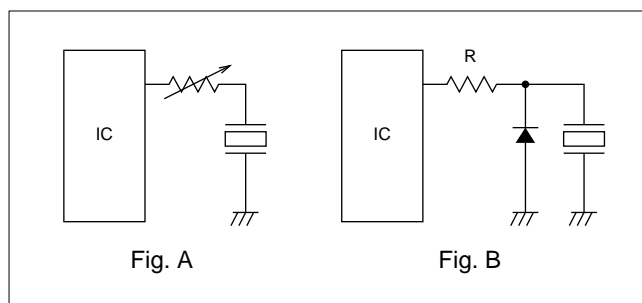


### ■ Notice (Soldering and Mounting)

Washing of the component is not acceptable, because it is not sealed.

### ■ Notice (Handling)

1. The component may be damaged if mechanical stress exceeding specifications is applied.
2. Take care to protect operating circuit from surge voltage resulting from excessive force, falling, shock or temperature change.
3. If DC voltage is applied to the component, silver migration may occur. Please pay full attention to avoid subjecting the component to DC voltage for long periods.
4. The resistor should be used as shown in Fig. A. A suitable resistance value should be chosen, preferably 1kΩ to 2kΩ. Instead of this measure, a diode may also be applied as shown in Fig. B.



5. Avoid excessive pulling of lead wire because wire may break or soldering point may come off.